Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-65. (Cancelled).

66. (Previously Presented) The method of claim 139, wherein said GPCR is a taste receptor.

67. (Previously Presented) The method of claim 139, wherein said reporter gene is selected from the group consisting of luciferase, GFP, chloramphenicol acetyl transferase, β-galactosidase, β-lactamase and secreted alkaline phosphatase.

68. (Previously Presented) The method of claim 139, further comprising contacting said cell with a compound that increases calcium levels inside said cell.

69. (Original) The method of claim 68, wherein said compound is selected from the group consisting of ionomycin and thapsigargin.

70. (Original) The method of claim 68, further comprising contacting said cell with phorbol myristate acetate or an analog thereof.

71-73. (Cancelled).

74. (Previously Presented) The method of claim 140, wherein said signal transduction detection system comprises an intracellular calcium indicator.

75-77. (Cancelled).

78. (Previously Presented) The method of claim 141, wherein said signal transduction detection system comprises an intracellular calcium indicator.

79. (Cancelled).

80. (Previously Presented) The method of claim 141, wherein said detecting comprises fluorescence detection.

81-83. (Cancelled).

84. (Previously Presented) The method of claim 142, wherein said detecting comprises fluorescence detection.

85. (Previously Presented) The method of claim 142, wherein said reporter gene is selected from the group consisting of luciferase, GFP, chloramphenicol acetyl transferase, β-galactosidase, β-lactamase and secreted alkaline phosphatase.

86. (Previously Presented) The method of claim 142, further comprising contacting said cell with a compound that increases calcium levels inside said cell.

87. (Original) The method of claim 86, wherein said compound is selected from the group consisting of ionomycin and thapsigargin.

88. (Currently Amended) The method of claim 86, further comprising contacting said cell with phorbol myristate acetate or a phorbol ester ~~or an analog thereof~~.

89-92. (Cancelled).

93. (Previously Presented) The method of claim 143, wherein said signal transduction detection system comprises an intracellular calcium indicator.

94-96. (Cancelled).

97. (Previously Presented) The method of claim 144, wherein said detecting comprises fluorescence detection.

98. (Previously Presented) The method of claim 144, wherein said reporter gene is selected from the group consisting of luciferase, GFP, chloramphenicol acetyl transferase, β-galactosidase, β-lactamase and secreted alkaline phosphatase.

99. (Previously Presented) The method of claim 144, further comprising contacting said cell with a compound that increases calcium levels inside said cell.

100. (Original) The method of claim 99, wherein said compound is selected from the group consisting of ionomycin and thapsigargin.

101. (Currently Amended) The method of claim 99, further comprising contacting said cell with phorbol myristate acetate or a phorbol ester ~~an analog thereof~~.

102-104. (Cancelled).

105. (Previously Presented) The method of claim 145, wherein said detecting comprises fluorescence detection.

106. (Previously Presented) The method of claim 145, wherein said reporter gene is selected from the group consisting of luciferase, GFP, chloramphenicol acetyl transferase, β-galactosidase, β-lactamase and secreted alkaline phosphatase.

107. (Previously Presented) The method of claim 145, further comprising contacting said cells with a compound that increases calcium levels inside said cells.

108. (Previously Presented) The method of claim 107, wherein said compound is selected from the group consisting of ionomycin and thapsigargin.

109. (Currently Amended) The method of claim 107, further comprising contacting said cell with phorbol myristate acetate or a phorbol ester ~~an analog thereof~~.

110. (Previously Presented) The method of claim 67, further comprising contacting said cell with a reporter gene substrate.

111. (Previously Presented) The method of claim 110, wherein said reporter gene is β-lactamase.

112. (Previously Presented) The method of claim 85, further comprising contacting said cell with a reporter gene substrate.

113. (Previously Presented) The method of claim 112, wherein said reporter gene is β-lactamase.

114. (Previously Presented) The method of claim 98, further comprising contacting said cell with a reporter gene substrate.

115. (Previously Presented) The method of claim 114, wherein said reporter gene is β-lactamase.

116. (Previously Presented) The method of claim 106, further comprising contacting said cell with a reporter gene substrate.

117. (Previously Presented) The method of claim 106, wherein said reporter gene is β-lactamase.

118. (Previously Presented) The method of claim 111, wherein said reporter gene substrate is CCF2.

119. (Previously Presented) The method of claim 113, wherein said reporter gene substrate is CCF2.

120. (Previously Presented) The method of claim 115, wherein said reporter gene substrate is CCF2.

121. (Previously Presented) The method of claim 117, wherein said reporter gene substrate is CCF2.

122. (Previously Presented) The method of claim 141, wherein said GPCR is selected from the group consisting of muscarinic receptors, nicotinic acetylcholine receptors, GABA receptors, glutamate receptors, adrenergic receptors, dopamine receptors and serotonin receptors.

123. (Previously Presented) The method of claim 142, wherein said GPCR is selected from the group consisting of muscarinic receptors, nicotinic acetylcholine receptors, GABA receptors, glutamate receptors, adrenergic receptors, dopamine receptors and serotonin receptors.

124. (Previously Presented) The method of claim 143, wherein said GPCR is selected from the group consisting of muscarinic receptors, nicotinic acetylcholine receptors, GABA receptors, glutamate receptors, adrenergic receptors, dopamine receptors and serotonin receptors.

125. (Previously Presented) The method of claim 144, wherein said GPCR is selected from the group consisting of muscarinic receptors, nicotinic acetylcholine receptors, GABA receptors, glutamate receptors, adrenergic receptors, dopamine receptors and serotonin receptors.

126. (Previously Presented) The method of claim 74, wherein said intracellular calcium indicator is Fura II.

127. (Previously Presented) The method of claim 78, wherein said intracellular calcium indicator is Fura II.

128. (Previously Presented) The method of claim 93, wherein said intracellular calcium indicator is Fura II.

129. (Previously Presented) The method of claim 147, wherein said calcium-responsive promoter is NFAT.

130. (Previously Presented) The method of claim 148, wherein said calcium-responsive promoter is NFAT.

131. (Previously Presented) The method of claim 149, wherein said calcium-responsive promoter is NFAT.

132. (Previously Presented) The method of claim 150, wherein said calcium-responsive promoter is NFAT.

133. (Previously Presented) The method of claim 139, wherein said method further comprises comparing said change in reporter gene expression detected in step (iii) with a change in reporter gene expression detected in a control COS-7 cell lacking said GPCR detected under the same conditions as in step (iii), wherein said control COS-7 cell is a COS-7 cell comprising elements a), b), and d) as set forth in claim 139, but lacking element c) as set forth in claim 139.

134. (Previously Presented) The method of claim 140, wherein said method further comprises comparing said change in signal detected in step (iii) with a change in signal detected in a control COS-7 cell lacking said GPCR detected under the same conditions as in step (iii), wherein said control COS-7 cell is a COS-7 cell comprising elements a) and c) of claim 140 but lacking element b) of claim 140.

135. (Previously Presented) The method of claim 141, wherein said method further comprises comparing said change in signal detected in step (ii) with a change in signal detected in a control COS-7 cell lacking said GPCR detected under the same conditions as in step (ii), wherein said control COS-7 cell is a COS-7 cell comprising elements a) and c) of claim 141 but lacking element b) of claim 141.

136. (Previously Presented) The method of claim 142, wherein said method further comprises comparing said change in reporter gene expression detected in step (ii) with a change in reporter gene expression detected in a control COS-7 cell lacking said GPCR detected under the same

conditions as in step (ii), wherein said control COS-7 cell is a COS-7 cell comprising elements a), b), and d) of claim 142 but lacking element c) of claim 142.

137. (Previously Presented) The method of claim 143, wherein said method further comprises comparing said change in reporter gene expression detected in step (iii) with a change in signal detected in a control COS-7 cell lacking said GPCR wherein said change is detected under the same conditions as in steps (ii) and (iii), wherein said control COS-7 cell is a COS-7 cell comprising elements a) and c) of claim 143 but lacking element b) of claim 143.

138. (Previously Presented) The method of claim 144, wherein said method further comprises comparing said change in reporter gene expression detected in step (iii) with a change in reporter gene expression detected in a control COS-7 cell lacking said GPCR, detected under the same conditions as in step (ii) and (iii), wherein said control COS-7 cell is a COS-7 cell comprising elements a), b), and d) of claim 144 but lacking element c) of claim.

139. (Previously Presented) A method of identifying a G-protein coupled receptor (GPCR) for a given ligand, the method comprising:

(i) providing a COS-7 cell, said COS-7 cell comprising,

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding a reporter gene, wherein said second heterologous promoter is directly or indirectly modulated by the activity of said Gα15 protein,

c) a third heterologous promoter operably linked to a third polynucleotide encoding said GPCR, wherein said GPCR is not naturally expressed in said cell, and

d) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) contacting said COS-7 cell with said ligand; and

(iii) detecting a change in reporter gene expression by comparing reporter gene expression prior to addition of said ligand with reporter gene expression after addition of said ligand.

140. (Previously Presented) A method for identifying a G-protein coupled receptor (GPCR) for a given ligand, the method comprising:

(i) providing a COS-7 cell, said COS-7 cell comprising,

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding said GPCR, wherein said GPCR is normally coupled to either $G\alpha_i$, $G\alpha_s$ or $G\alpha_{12}$ in the absence of said Gα15 protein, and wherein said GPCR is not naturally expressed in said cell, and

c) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) contacting said COS-7 cell with said ligand; and

(iii) detecting a change in a signal with a signal transduction detection system by comparing said signal prior to addition of said ligand with said signal after addition of said ligand, wherein said signal transduction detection system comprises a dye.

141. (Previously Presented) A method of a identifying a ligand for a given G-protein coupled receptor (GPCR), the method comprising:

(i) contacting a COS-7 cell with a test chemical, said COS-7 cell comprising,

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding said GPCR, wherein said GPCR is normally coupled to either $G\alpha_i$, $G\alpha_s$ or $G\alpha_{12}$ in the absence of said Gα15 protein, and wherein said GPCR is not naturally expressed in said cell, and

c) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) detecting a change in a signal with a signal transduction detection system by comparing said signal prior to addition of said test chemical with said signal after addition of said test chemical, wherein said signal transduction detection system comprises a dye, and wherein a change in said signal identifies said test chemical as a ligand for said GPCR.

142. (Previously Presented) A method of identifying a ligand for a given G-protein coupled receptor (GPCR), the method comprising:

(i) contacting a COS-7 cell with a test chemical, said COS-7 cell comprising,

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding a reporter gene, wherein said second heterologous promoter is directly or indirectly modulated by the activity of said Gα15 protein,

c) a third heterologous promoter operably linked to a third polynucleotide encoding said GPCR, wherein said GPCR is not naturally expressed in said cell, and

d) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator; and

(ii) detecting a change in reporter gene expression by comparing reporter gene expression prior to addition of said test chemical with reporter gene expression after addition of said test chemical, wherein a change in reporter gene expression identifies said test chemical as a ligand for said GPCR.

143. (Previously Presented) A method for identifying a modulator of signal transduction mediated by G-protein coupled receptor (GPCR) activation in a cell, the method comprising:

(i) contacting a COS-7 cell with a ligand that in the absence of a test chemical, activates signal transduction in said COS-7 cell, said COS-7 cell comprising:

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding said GPCR, wherein said GPCR is normally coupled to either $G\alpha_i$, $G\alpha_s$ or $G\alpha_{12}$ in the absence of said Gα15 protein, and wherein said GPCR is not naturally expressed in said cell, and

c) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) contacting said cell with said test chemical, and

(iii) detecting a change in a signal with a signal transduction detection system by comparing said signal prior to addition of said test chemical with said signal after addition of said test chemical.

144. (Previously Presented) A method for identifying a modulator of signal transduction in a cell, the method comprising:

(i) contacting a COS-7 cell with a ligand that in the absence of a test chemical, activates signal transduction via a GPCR in said COS-7 cell, said COS-7 cell comprising,

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding a reporter gene, wherein said second heterologous promoter is directly or indirectly modulated by the activity of said Gα15 protein,

c) a third heterologous promoter operably linked to a third polynucleotide encoding said GPCR, wherein said GPCR is not naturally expressed in said cell, and

d) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) contacting said COS-7 cell with said test chemical; and

(iii) detecting a change in reporter gene expression by comparing reporter gene expression prior to addition of said test chemical with reporter gene expression after addition of said test chemical.

145. (Previously Presented) A method of functionally profiling a test chemical, comprising the steps of:

(i) contacting a panel of COS-7 cells with said test chemical, said panel of COS-7 cells comprising a plurality of COS-7 cell clones, wherein each COS-7 cell clone differs from the other COS-7 cell clones with respect to a GPCR that is expressed therein, each COS-7 cell clone comprising:

a) a first heterologous inducible CMV promoter operably linked to a heptamerized tet operator and to a first polynucleotide encoding a functional Gα15 protein having at least 95% sequence homology to SEQ. ID. NO. 2,

wherein said CMV promoter provides for low level expression of said Gα15 protein prior to induction,

wherein induction of said CMV promoter provides for at least a three fold increase in expression of said Gα15 protein, and

wherein induced expression of said Gα15 protein is sufficient to permit promiscuous coupling to said GPCR,

b) a second heterologous promoter operably linked to a second polynucleotide encoding a reporter gene, wherein said second heterologous promoter is directly or indirectly modulated by the activity of said Gα15 protein,

c) a third heterologous promoter operably linked to a third polynucleotide encoding said GPCR, wherein said GPCR is not naturally expressed in said cell, and

d) a constitutive promoter operably linked to a polynucleotide encoding a tetracycline-dependent transactivator;

(ii) detecting reporter gene expression from each of said COS-7 cell clones in said panel; and

(iii) comparing reporter gene expression among said COS-7 cell clones in said panel.

146. (Previously Presented) The method of claim 145, wherein said method further comprises comparing said reporter gene expression in said COS-7 cell clones in said panel detected in step (iii) with a change in reporter gene expression detected in a control COS-7 cell lacking a GPCR detected under the same conditions as in step (iii), wherein said control COS-7 cell is a COS-7 cell comprising elements a), b), and d) as set forth in claim 145, but lacking element c) as set forth in claim 145.

147. (Previously Presented) The method of claim 139, wherein said second heterologous promoter is a calcium-responsive promoter.

148. (Previously Presented) The method of claim 142, wherein said second heterologous promoter is a calcium-responsive promoter.

149. (Previously Presented) The method of claim 144, wherein said second heterologous promoter is a calcium-responsive promoter.

150. (Previously Presented) The method of claim 145, wherein said second heterologous promoter is a calcium-responsive promoter.